

SEQUENCE LISTING

```
<110> Handfield, Martin
      Brady, Jeannine
      Progulske-Fox, Ann
      Hillman, Jeffrey D.
<120> Microbial Polynucleotides Expressed During Infection of
      a Host
<130> MBHB00-505B
<140>
<141>
<150> 60/147,551
<151> 1999-08-06
<150> PCT/US00/21340
<151> 2000-08-04
<160> 20
<170> PatentIn Ver. 2.1
<210> 1
<211> 849
<212> DNA
<213> Actinobacillus actinomycetemcomitans
<220>
<221> misc_feature
<222> (566)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (625)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (627)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (636)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (650)
<223> N stands for any nucleotide.
```

<220>

<221> misc_feature

```
<222> (656)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (661)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (672)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (681)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (720)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (723)
<223> N stands for any nucleotide.
<400> 1
gatcgcgtaa acggtgtaac acggaaagca attgtttaat gtcggcaaaa tgcaqccctq 60
tggtcggttc gtccagaata tacagggttt tgcccgtatc ccgtttggag agttccgtcg 120
ccagtttcac ccgttgcgct tccccgccgg acagggtggt agaggattgc cccaagcgaa 180
tataagacaa gcccacgtca atcagggttt gcaatttacg cqcaatcatt qqaatqqcat 240
cgaaaaactc gcgcgcatct tccaccgtca tgtccagcac ctgatgaatg gttttacctt 300
tgtagcggat ttccagggtt tcgcgattgt aacgcttgcc tttacattgg tcgcaaggca 360
cgtacacatc gggcaggaag tgcatttcca ctttgattac gccgtcgccc tggcaggctt 420
acagegeeeg cegegeaegt taaaaetgaa acgeeeeggg ttataacege gegeaeggge 480
tttcggtacg ccggcaaaca attcgcgaat cggcgtgaat acgcccgtgt aagttgcccg 540
gttggagcgt ggcgtgcgtc caatcnggct ttggttaata tcaatacttt atcgaaaaat 600
tccaaacctt taatggactt gtacngngaa acctcngcat tttctgcacn attaangcgt 660
nttgtgcaat anggaacaaa ntgtcgttaa tcagtgtaga atttacctta accggacacn 720
congtgatgo aggtaaataa goocacggga atgtotaaat tgacgttttt caggttgtta 780
ccggaagcgc cgaacaattt gagcattttt ttcttatcaa gtgcggtacg ttttttcggt 840
atttcgatc
                                                                   849
<210> 2
<211> 357
<212> DNA
<213> Actinobacillus actinomycetemcomitans
<400> 2
gatcactaag tigticaatc cittcgcttg ggaatcittg tctaaatacg gittatgttg 60
cattgcgtta acgtctaaat cacctttaga cactgcagtg tttggcaagg cgtaqtcatq 120
aataaaacgt attctacgtc taagttgtat ttttcttttg ccactttcgc tgcgatttca 180
gccacttggt gttccggtcc tgccatcacg cccactttga ttgttgccgg ggcttctgcc 240
gccggtttgt ctgccggtgc ggcttccggt tttttctctt cattacaagc ccgttaaggc 300
```

#6

357

gaatacggag gctaatgttg cgacgcctaa taatttttt caagttcata aaagatc

```
<210> 3
<211> 886
<212> DNA
<213> Actinobacillus actinomycetemcomitans
<220>
<221> misc feature
<222> (554)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (596)
<223> N stands for any nucleotide.
<400> 3
gatcaaactg gtggcgcaag ggcagcgcgt agcaaattta cccgatattt tggtctatgc 60
gegegtegge aacggcatgg tagggcgacg ccgtggttta aaccaagcca aagcggaatg 120
gegettattt aagetaaaac accatettgg catteaggga tttttateeg ggetatteac 180
ttttgtcctg cgttccggtg ccagattatt gccgacatca ttactgaaaa acatctatca 240
aaccttttta agaaaataac atgatgaaat taaactgtat tttaaaaaata tccggaattt 300
ccaccgcact ttttctagcg ggttgttcct caaattcaag tgcgccgacg caatcctctg 360
agcaggcgaa ttctgttacg gctgtgaatc ccactgcggt gtacagtaag ccccgcactt 420
tggataactt caacgattat gtgaatttct taaaaggtaa agcagcggca gaaggcgttt 480
ctgccgacgt attgaatgca caaaataata ttaattatat tcaaaaatcc gtggatttgg 540
acgatcaaca agcnggcaga attcgcaagc gtgatccaaa tgccccgccg atcatnaatt 600
ccgaacggca cgaccaatta cttaaatcgt gtattaacca agaataaagt agacacggca 660
gaagcacgtt attgggaaca attgccgcag cttgaaaatg cttcaaagaa attcagcgta 720
ccgaaaaatt atctgttagc cttgtggggc atggagagta gctttggcta ttatcagggc 780
aattacgatg tgttatccac cttagccact cttgcttttg acggacgccg tgaagcctta 840
ttcagcaaag aattcatcgc cgccatgaaa atgctacagc gcgatc
<210> 4
<211> 507
<212> DNA
<213> Actinobacillus actinomycetemcomitans
<220>
<221> misc_feature
<222> (4)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (9)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (21)
<223> N stands for any nucleotide.
```

<220>

```
<221> misc_feature
<222> (23)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (29)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (32)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (35)..(36)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (39)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (42)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (45)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (49)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (52)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (58)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (61)..(62)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (65)
```

```
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (69)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (73)
<223> N stands for any polynucleotide.
<220>
<221> misc_feature
<222> (97)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (102)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (138)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (457)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (459)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (467)
<223> N stands for any nucleotide.
<400> 4
ttgntaccnt agccgctgac nanaactanc angcnntgna tnatntcgna tnattaanat 60
nngcnaggng cancagetta cetttgeega eggttenetg tntgaaageg ceattegeaa 120
agtgccggtg gaggcggnga aaattcactc acttggtgcg gaaggcaatg atgtgggatt 180
gaaagcccat catggcgggt ggataaagcg ttattttta tgtcggcaga tgcctttcct 240
gcgttaaatg cgttattaga cgaaaatttt tcgtatcagg acacagcagt ttacggcgag 300
aattttgtgg tttccgcgct gaatgaagat tccgtgtgtg tgggcgatat ttatcaaatc 360
ggctcctgcg tggtggaggt gtcgcagccg cgtaaacctt gtgagcgctt atcgaaaaat 420
accaataatc cgaacacgca acaaaccgtg tacgctncng ctggtcnggc tggtatgtgc 480
cggtggtacc ccaaggggga aattcaa
                                                                   507
<210> 5
<211> 1087
<212> DNA
```

```
<213> Actinobacillus actinomycetemcomitans
<220>
<221> misc feature
<222> (622)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (642)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (661)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (669)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (685)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (690)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (700)
<223> N stands for any nucleotide.
<400> 5
gatcgcaaca agcgcagttt ctatatttcc gccgcccgca gtgagatttt caatttaatc 60
gttgccaaac gtattgaact cagtctggcg cagcaggtct taaatggaga cgttttgcaa 120
ctgaacggtt cgcacagttg gtttgtggcg gacgcatcgg aagatttgac gcaactgcaa 180
agtgcggtgg attttgagaa tgaaattttt gtcgcgcacc aagccttgtt ccatttgatg 300
cggcaagaac gcgtgaaagc cgcccgccgt ccgattttaa tgcaggcgca acagtttcaa 360
tggcaatttg aaccgaacgg tttgcgcctt aaattttatt tgccggcagg cagttacgcc 420
acggcgttgg tacgcgagct ggtgaatgtt gaaaactgaa aaacgagaag aaaaacagga 480
ataacaagaa catgaatatt ttattaagta acgatgacgg cattcacgcg ccgggcattc 540
gtgtgatggc agaacattgc gtaagattgc caatgtgacc atcgtcgcgc cggacagcaa 600
ccgcaagcgc cgccttcagt tncttaacct tggtgaagcc gntgtattcc gttcatttgg 660
naaagcggng attattgcgt caacngcacn cccggcggan tgcgtgcata ttgccctgac 720
gggttttctt tccgggcgca tcgatttggt gatttccggc atcaacgccg gggcgaacct 780
gggcgatgat gtgctatatt ccggcacggt cgcggcagca tttgaagggc gtcatctggg 840
cttgccgtct attgcggtat cgctcgatgg tcgtcaacat tttgaaacgg cggcgcgcgt 900
ggtatgcgat ttggtgccga aattacacgc ccaattatta ggcaaacacg aaattctgaa 960
tattaacgtg cccgatgtgc cttacgaaga actgaaaggc attaaagtgt gccatttggg 1020
ctaccgttct tccgcttctg aagtgattaa acagcaaagc ccgcgtggcg aagacatgta 1080
ttggatc
                                                                1087
```

```
<210> 6
<211> 681
<212> DNA
<213> Actinobacillus actinomycetemcomitans
<220>
<221> misc_feature
<222> (609)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (614)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (651)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (665)
<223> N stands for any nucleotide.
<400> 6
gatctgccgt tggcgaaccc ttacgaaatg ctgatcctcg cgtccatcgt ggaaaaagaa 60
accggcattg ctgcagaacg cccacaagtg gcgtcggtat tcattaatcg gttaaaagcc 120
aaaatgaagc tgcaaaccga tccgaccgtc atttacggca tgggcgacga ctacaacggc 180
aatattcgca aaaaagattt ggaaacgcca acgccttata acacctatgt gattgacggc 240
ttgccgccga caccgattgc gatgccgagt gaagaggcgt tacaggcggt ggcacatccg 300
gcgcaaacgg cgttttatta tttcgtggca gacggcacgg ggggacacaa attcagtcgt 360
aatttaaacg aacataacaa agcggtgcag caatatttgc gctggtaccg cgaacaaaac 420
ggaaaataat atggtaggca aatttattgt cattgaaggc ttggaaggcg caggcaaaag 480
caccgctcat caatgcgttg tggatacgtt aaaaacgtta ggtgttgggg aagtcatctc 540
tacccgcgag ccgggcggca cacccgttgg cggaaaagct acgccatctc attaaacatg 600
aaaaccaana gccngtgacc cgataaagcg gaattactca tgctgtatgc ngccgcctgc 660
aattngtggg aaaatgtgat c
                                                                   681
<210> 7
<211> 822
<212> DNA
<213> Actinobacillus actinomycetemcomitans
<220>
<221> misc_feature
<222> (532)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (630)
<223> N stands for any nucleotide.
```

```
<220>
<221> misc feature
<222> (696)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (710)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (722)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (725)
<223> N stands for any nucleotide.
<400> 7
gatcgataaa aatcagcaag gcaaccactc ttaacaagaa ttgccatacc gtccaatatc 60
gtcgccaata ctgaatcgcg tagagcatgg ctaacgcaat catagcgcgt aaagtcggaa 120
tagcaagccc cgccagttgg ctgtataaca acgcaaaaat gaatccgcac agaatcggaa 180
atgtcgggct gatgtaacgc gtcggcaagg caaattgcag tagacgcgcc aaggtaaaac 240
ccagcatcat cgccagtccg atatgcagcc ctgaaatggc aattaaatgc gccgtatttg 300
ttttttgata aatttgccaa gttttttggt ctaagcggaa acgttcgcca aaaccgagtg 360
ccagcaacaa gccttgtcgg ggtaaattct ccgtttgttg taaggcttga ttgagagcgg 420
tttggcgtaa cgaaaaaacg ttttccaatt tgaccgcact tttaatctct qcccaaqcqq 480
tgatgtgctt gccgaaatac catggctggc ggtcaaaacc gtcaaaattc angcgggaag 540
aaagcgctcg caagcgtaaa ttgcctgcgt aacgttcgcc cggggttgac tggttgcttg 600
agtttccatt gcgcgtaaat acgttgttcn gggaagattt tcggcgaagt tttggcgccg 660
aataacccag gggttggata atgctgctga tgccanaaat ttccttgacn ggtaaatttc 720
cnggnggaac gggttttcgg cggcagattg gcaagattat ccgcctgggt cagtatggaa 780
attgccgatt ggtggacgta agcggactga atcatcaaga tc
                                                                   822
<210> 8
<211> 949
<212> DNA
<213> Actinobacillus actinomycetemcomitans
<220>
<221> misc feature
<222> (538)
<223> N stands for any nucleotide.
<400> 8
gatcaggttg ccgtaaccgc gtaaggcgtt acccgcgtaa accactcgac ctgcggcggc 60
ggcattgact gcttgtctgc gagaaccact gatgtcgatg cctttgttac cgccgtcggc 120
gttagagaaa ccttgaatca cattgccgtt ggtcggccag cgccatgcca cgttggatac 180
tgccggtgcg gtgcccgctt gggttatcgg ctgattggtt gccggtgcag cagtacctac 240
gccggcttta atcgggccgg taatcgtgcc gtcggaacca tattgtgtgc cgtttgcgcc 300
cggggtgtaa gttacggtcg gttcaccacc ttgcgtagcc ggttgggtga ccgtcggttg 360
catttgcggt gcagctttcg tttgcaccgt aaccgttgtg ccgcggctca cctttaaggt 420
ttgtccgacg cttaagctgt aaggttcgga catattattc aacgccgcca attctttcac 480
atccaaacca gaaatgtagg cgataaggaa catggtgtca cctttgcgta cggtatangt 540
```

```
ttcacctttg tagaaacctt tgttgatttg gctgtaatcc ggtgcgttag tggtcgggtt 600
acctggaatg gtgaaatctt gggatgcctg ttgcgggtga attttccccg gcaggttggg 660
tttgcttaac ccggttgtgc tttgcaatgc aaactgttga tacatcggtt gaaaaatcgg 720
ctgcggagta gattgtgcgc cggtcgcctg tagattgttc gactgggcaa tcggaccgtt 780
categaageg ggtacattqc ettqttqqat ttqcqqttcc catqtqctat tqccqccatc 840
ggttgaaccg tccaccggtt gcatgagtcc cggggataag gtaccgtcgg cgttttccac 900
cggtgccggt gtattcgaag tacaggccgc taacacggca atgctgatc
                                                                949
<210> 9
<211> 277
<212> DNA
<213> Actinobacillus actinomycetemcomitans
<400> 9
agagaaaaaa ccggaagccg caccggcaga caaaccggcg gcagaagccc cggcaacaat 60
caaagtgggc gtgatggcag gaccggaaca ccaagtggct gaaatcgcag cgaaagtggc 120
aaaagaaaaa tacaacttag acgtagaata cgttttattc atgactacgc cttqccaaac 180
actgcagtgt ctaaaggtga tttagacgtt aacgcaatgc aacataaacc gtatttagac 240
aaagattccc aagcgaaagg attgaacaac ttagtga
                                                                277
<210> 10
<211> 259
<212> DNA
<213> Actinobacillus actinomycetemcomitans
<400> 10
gatcaaactg gtggcgcaag ggcagcgcgt agcaaattta cccgatattt tggtctatgc 60
gcgcgtcggc aacggcatgg tagggcgacg ccgtggttta aaccaagcca aagcggaatg 120
gcgcttattt aagctaaaac accatcttgg cattcaggga tttttatccg ggctattcac 180
ttttgtcctg cgttccggtg ccagattatt gccgacatca ttactgaaaa acatctatca 240
aaccttttta agaaaataa
                                                                259
<210> 11
<211> 459
<212> DNA
<213> Actinobacillus actinomycetemcomitans
<400> 11
gatcgcaaca agcgcagttt ctatatttcc gccgcccgca gtgagatttt caatttaatc 60
gttgccaaac gtattgaact cagtctggcg cagcaggtct taaatggaga cgttttgcaa 120
ctgaacggtt cgcacagttg gtttgtggcg gacgcatcgg aagatttgac gcaactgcaa 180
agtgcggtgg attttgagaa tgaaattttt gtcgcgcacc aagccttgtt ccatttgatg 300
cggcaagaac gcgtgaaagc cgcccgccgt ccgattttaa tgcaggcgca acagtttcaa 360
tggcaatttg aaccgaacgg tttgcgcctt aaattttatt tgccggcagg cagttacgcc 420
acggcgttgg tacgcgagct ggtgaatgtt gaaaactga
<210> 12
<211> 596
<212> DNA
<213> Actinobacillus actinomycetemcomitans
<220>
```

```
<221> misc_feature
<222> (131)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (151)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (170)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (178)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (194)
<223> N stands for any nucleotide.
<220>
<221> misc feature
<222> (199)
<223> N stands for any nucleotide.
<220>
<221> misc_feature
<222> (209)
<223> N stands for any nucleotide.
<400> 12
atgaatattt tattaagtaa cgatgacggc attcacgcgc cgggcattcg tgtgatggca 60
gaacattgcg taagattgcc aatgtgacca tcgtcgcgcc ggacagcaac cgcaagcgcc 120
gccttcagtt ncttaacctt ggtgaagccg ntgtattccg ttcatttggn aaagcggnga 180
ttattgcgtc aacngcacnc ccggcggant gcgtgcatat tgccctgacg ggttttcttt 240
ccgggcgcat cgatttggtg atttccggca tcaacgccgg ggcgaacctg ggcgatgatg 300
tgctatattc cggcacggtc gcggcagcat ttgaagggcg tcatctgggc ttgccgtcta 360
ttgcggtatc gctcgatggt cgtcaacatt ttgaaacggc ggcgcgcgtg gtatgcgatt 420
tggtgccgaa attacacgcc caattattag gcaaacacga aattctgaat attaacgtgc 480
ccgatgtgcc ttacgaagaa ctgaaaggca ttaaagtgtg ccatttgggc taccgttctt 540
ccgcttctga agtgattaaa cagcaaagcc cgcgtggcga agacatgtat tggatc
<210> 13
<211> 429
<212> DNA
<213> Actinobacillus actinomycetemcomitans
<400> 13
gatctgccgt tggcgaaccc ttacgaaatg ctgatcctcg cgtccatcgt ggaaaaagaa 60
accggcattg ctgcagaacg cccacaagtg gcgtcggtat tcattaatcg gttaaaagcc 120
aaaatgaagc tgcaaaccga tccgaccgtc atttacggca tgggcgacga ctacaacggc 180
aatattcgca aaaaagattt ggaaacgcca acgccttata acacctatgt gattgacggc 240
```

ttgccgccga caccgattgc gatgccgagt gaagaggcgt tacaggcggt ggcacatccg 300 gcgcaaacgg cgttttatta tttcgtggca gacggcacgg ggggacacaa attcagtcgt 360 aatttaaacg aacataacaa agcggtgcag caatatttgc gctggtaccg cqaacaaaac 420 ggaaaataa <210> 14 <211> 162 <212> DNA <213> Actinobacillus actinomycetemcomitans <400> 14 atggtaggca aatttattgt cattgaaggc ttggaaggcg caggcaaaag caccgctcat 60 caatgcgttg tggatacgtt aaaaacgtta ggtgttgggg aagtcatctc tacccgcgag 120 ccgggcggca cacccgttgg cggaaaagct acgccatctc at 162 <210> 15 <211> 67 <212> PRT <213> Actinobacillus actinomycetemcomitans <400> 15 Glu Lys Lys Pro Glu Ala Ala Pro Ala Asp Lys Pro Ala Ala Glu Ala Pro Ala Thr Ile Lys Val Gly Val Met Ala Gly Pro Glu His Gln Val 20 Ala Glu Ile Ala Ala Lys Val Ala Lys Glu Lys Tyr Asn Leu Asp Val Glu Tyr Val Leu Phe Met Thr Thr Pro Cys Gln Thr Leu Gln Cys Leu 55 Lys Val Ile 65 <210> 16 <211> 85 <212> PRT <213> Actinobacillus actinomycetemcomitans <400> 16 Ile Lys Leu Val Ala Gln Gly Gln Arg Val Ala Asn Leu Pro Asp Ile 10 Leu Val Tyr Ala Arg Val Gly Asn Gly Met Val Gly Arg Arg Arg Gly Leu Asn Gln Ala Lys Ala Glu Trp Arg Leu Phe Lys Leu Lys His His Leu Gly Ile Gln Gly Phe Leu Ser Gly Leu Phe Thr Phe Val Leu Arg 50

Ser Gly Ala Arg Leu Leu Pro Thr Ser Leu Leu Lys Asn Ile Tyr Gln 65 70 75 80

Thr Phe Leu Arg Lys

<210> 17

<211> 152

<212> PRT

<213> Actinobacillus actinomycetemcomitans

<400> 17

Asp Arg Asn Lys Arg Ser Phe Tyr Ile Ser Ala Ala Arg Ser Glu Ile 1 5 10 15

Phe Asn Leu Ile Val Ala Lys Arg Ile Glu Leu Ser Leu Ala Gln Gln
20 25 30

Val Leu Asn Gly Asp Val Leu Gln Leu Asn Gly Ser His Ser Trp Phe
35 40 45

Val Ala Asp Ala Ser Glu Asp Leu Thr Gln Leu Gln Gln Arg Leu Ala 50 55 60

Gln Arg Asp Ile Leu Leu Thr Ala Pro Leu Ile Gly Glu Glu Asp Lys 65 70 75 80

Ser Ala Val Asp Phe Glu Asn Glu Ile Phe Val Ala His Gln Ala Leu 85 90 95

Phe His Leu Met Arg Gln Glu Arg Val Lys Ala Ala Arg Arg Pro Ile 100 105 110

Leu Met Gln Ala Gln Gln Phe Gln Trp Gln Phe Glu Pro Asn Gly Leu 115 120 125

Arg Leu Lys Phe Tyr Leu Pro Ala Gly Ser Tyr Ala Thr Ala Leu Val 130 135 140

Arg Glu Leu Val Asn Val Glu Asn 145 150

<210> 18

<211> 198

<212> PRT

<213> Actinobacillus actinomycetemcomitans

<220>

<221> UNSURE

<222> (43)

<223> Xaa stands for any amino acid.

<220>

<221> UNSURE

<222> (50)

```
<223> Xaa stands for any amino acid.
<220>
<221> UNSURE
<222> (59)
<223> Xaa stands for any amino acid.
<220>
<221> UNSURE
<222> (66)
<223> Xaa stands for any amino acid.
<220>
<221> UNSURE
<222> (69)
<223> Xaa stands for any amino acid.
<400> 18
Met Asn Ile Leu Leu Ser Asn Asp Asp Gly Ile His Ala Pro Gly Ile
                                      10
Arg Val Met Arg Thr Leu Arg Lys Ile Ala Asn Val Thr Ile Val Ala
Pro Asp Ser Asn Arg Lys Arg Arg Leu Gln Xaa Leu Asn Leu Gly Glu
Ala Xaa Val Phe Arg Ser Phe Gly Lys Ala Xaa Ile Ile Ala Ser Thr
Ala Xaa Pro Ala Xaa Cys Val His Ile Ala Leu Thr Gly Phe Leu Ser
Gly Arg Ile Asp Leu Val Ile Ser Gly Ile Asn Ala Gly Ala Asn Leu
Gly Asp Asp Val Leu Tyr Ser Gly Thr Val Ala Ala Ala Phe Glu Gly
                                105
Arg His Leu Gly Leu Pro Ser Ile Ala Val Ser Leu Asp Gly Arg Gln
        115
                            120
His Phe Glu Thr Ala Ala Arg Val Val Cys Asp Leu Val Pro Lys Leu
His Ala Gln Leu Leu Gly Lys His Glu Ile Leu Asn Ile Asn Val Pro
                    150
                                        155
Asp Val Pro Tyr Glu Glu Leu Lys Gly Ile Lys Val Cys His Leu Gly
                165
Tyr Arg Ser Ser Ala Ser Glu Val Ile Lys Gln Gln Ser Pro Arg Gly
```

13

Glu Asp Met Tyr Trp Ile 195 190

```
<210> 19
```

<211> 142

<212> PRT

<213> Actinobacillus actinomycetemcomitans

<400> 19

Asp Leu Pro Leu Ala Asn Pro Tyr Glu Met Leu Ile Leu Ala Ser Ile 1 5 10 15

Val Glu Lys Glu Thr Gly Ile Ala Ala Glu Arg Pro Gln Val Ala Ser 20 25 30

Val Phe Ile Asn Arg Leu Lys Ala Lys Met Lys Leu Gln Thr Asp Pro 35 40 45

Thr Val Ile Tyr Gly Met Gly Asp Asp Tyr Asn Gly Asn Ile Arg Lys
50 55 60

Lys Asp Leu Glu Thr Pro Thr Pro Tyr Asn Thr Tyr Val Ile Asp Gly 65 70 75 80

Leu Pro Pro Thr Pro İle Ala Met Pro Ser Glu Glu Ala Leu Gln Ala 85 90 95

Val Ala His Pro Ala Gln Thr Ala Phe Tyr Tyr Phe Val Ala Asp Gly
100 105 110

Thr Gly Gly His Lys Phe Ser Arg Asn Leu Asn Glu His Asn Lys Ala 115 120 125

Val Gln Gln Tyr Leu Arg Trp Tyr Arg Glu Gln Asn Gly Lys 130 135 140

<210> 20

<211> 54

<212> PRT

<213> Actinobacillus actinomycetemcomitans

<400> 20

Met Val Gly Lys Phe Ile Val Ile Glu Gly Leu Glu Gly Ala Gly Lys

1 10 15

Ser Thr Ala His Gln Cys Val Val Asp Thr Leu Lys Thr Leu Gly Val 20 25 30

Gly Glu Val Ile Ser Thr Arg Glu Pro Gly Gly Thr Pro Val Gly Gly 35 40 45

Lys Ala Thr Pro Ser His 50